

Class I, HEXAPODA.

Order II, COLEOPTERA.

NOTES ON LEPTINOTARSA UNDECIMLINEATA
STÅL.

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The chrysomelid beetle *Leptinotarsa undecimlineata* Stål was found by the writer in great abundance on the 17th of June, 1905, at Carmen and at other points in the state of Vera Cruz, Mexico, along the railroad running southeastward from Cordoba to Santa Lucrecia on the Isthmus of Tehuantepec. The insects were feeding upon *Solanum torvum* L., and had evidently been stimulated to sexual activity by the first rains of the wet season. Many pairs were found in copula and one cluster of eggs was found, placed on the underside of a leaf as in our *L. decemlineata*. These eggs of *L. undecimlineata* are of an extremely pale yellow, in remarkable contrast with the deep golden yellow, almost orange color of the eggs of *L. decemlineata*. There were no larvæ at this time.

The females are remarkable in the enormously distended abdomen, a condition supposedly peculiar and characteristic in certain genera of Chrysomelidæ. In these females of *L. undecimlineata* the abdomen is swollen to such a degree that it is not only exposed at the sides and between the widely divergent elytra, but a large portion of it protrudes beyond the tips of the elytra. The fourth and succeeding segments project beyond the elytra in a specimen preserved in fluid, taken by Mr. B. Jordan in Alta Vera Paz, Guatemala. On the exposed abdomen the dorsal plates appear as narrow black transverse strips upon the broad white area of the expanded connecting tissue. This condition of the female is even indicated in dried specimens where the elytra have come together over the shrunken abdomen; the sutural margins of the elytra show a slight divergence towards the tip. In the genus *Gastroidea*, noted for the greatly swollen abdomen of the fertile female, there is a modification of the abdominal integument. In some females of *G. cyanea* examined by the writer the entire integument of the abdomen is uniformly pigmented and apparently of the same texture throughout.

The coloration of *Leptinotarsa undecimlineata* is noteworthy. While dried specimens differ but little in this respect from *L. decemlineata*, the ground color of the elytra and thorax of the live specimens is a peculiar very pale greenish gray, and this in the breeding season when the colors should be at their fullest and no immature individuals present.

Dr. E. Dugès has given a detailed description, accompanied by figures, of the early stages of this beetle.* He describes the larva as white in color with black markings. The markings are very different from those of our *L. decemlineata* and the species related to it. The head, legs and prothoracic shield are black. The meso- and meta-thorax bear small black lunar marks at the sides. Segments 1-6 of the abdomen have heavy black lunar marks at the sides which involve the stigmata; on segments 1-5 the ends of the opposing lunules are connected by slender, more or less broken, dorsal lines. Segments 6, 7 and 8 bear quadrate black dorsal areas. These markings vary greatly in amount and all intergrades occur to a form in which only round black stigmatal spots are present. This is the form figured by W. L. Tower.† The pupa is white with only the stigmata black.

The food plant is large and spiny with coarsely hairy leaves. Dr. Dugès gives its name as *Solanum tardum* but as no species of that name is known the above mentioned *Solanum torvum* is doubtless intended.

Dugès has found many of the larvæ, particularly the young ones, more or less covered with the hairs from the leaves of the food-plant. As these hairs are attached very irregularly and are absent in many larvæ he assumes they adhere accidentally during the movements of the larva in feeding and are not adopted as a defensive covering. Tower describes this condition in the following words: "As the small larvæ push about through the abundant trichomes on the leaves of their food plants, a large accumulation of these become lodged among and cemented to the spines by the secretion of the dermal glands, until the larva presents the color and appearance of a ball of dislodged trichomes. . . . The integument in this second stage is smooth and entirely devoid of spines on the tergal and sternal elements of the seg-

* Ann. Soc. Ent. Belg., Vol. XXVIII, pp. 1-6, Pl. I, 1884; Spanish translation: La Naturaleza, Vol. VII, pp. 308-311, Pl. VIII, 1887.

† An investigation of evolution in chrysomelid beetles of the genus *Leptinotarsa*, 1907, pl. 17, figs. 1, 2 and 3.

ments. Owing to the sticky secretion of the dermal glands a deposit of trichomes gathers on the larva in this stage, though, owing to the absence of spines, this deposit is thinner than in the previous stage. . . . In the final stage the increase in the body surface, which is not accompanied by any great increase in the number of dermal glands, results in there being on the body only a very slight deposit of trichomes, if any at all, so that the larvæ are freely exposed on the leaves of their food-plant.'* *

But by far the most remarkable detail of the account of Dugès relates to the eggs. These are stated to be stalked and laid in groups of 100-150. These eggs are disposed in two layers or stories, those of the upper story being elevated above the others by slender stalks. The group consists first of a row of eggs attached at one extremity by a sort of foot and in contact with each other. This is followed by a second row, parallel to the first, but these eggs are upon slender stalks which raise them above the lower layer. This row is followed by a third one of low-stalked eggs and this by a fourth row of long-stalked ones. The arrangement is somewhat irregular and the long-stalked eggs are less numerous than the others. As far as I am aware no case of eggs upon stalks has ever been recorded for the Chrysomelini by other observers. In the entire group of Chrysomelidæ, with the exception of this single case, stalked eggs are known only from the Clytrini. Nevertheless it can hardly be assumed that Dugès was in error, as in other respects his description of the eggs answers very well for this group and he evidently bred the species from these eggs.

Leptinotarsa undecimlineata is credited to the fauna of the United States on the strength of an old record for southern California which is erroneous beyond a doubt. Mr. G. Beyer, who collected thoroughly in Lower California, writes me that he did not meet this species there. Dr. Dugès' records for the states of Michoacan and Guanajuato probably indicate the northernmost range of this species.

The record of this species from Matamoros in Tamaulipas, near Brownsville, Texas, by C. H. T. Townsend † is based upon an erroneous determination. The specimens are described in detail by Townsend and are unquestionably the species recently characterized by Mr. Chas. Schaeffer as *Leptinotarsa texana*. ‡

* *L. c.*, p. 146.

† *Trans. Tex. Acad. Sci.*, Vol. V, pp. 82-84, 1903.

‡ *Science Bulletin, Brooklyn Inst. Arts & Sci.*, Vol. I, p. 239, 1906.

The larva of *L. texana* is carefully described by Townsend and differs from that of our common *L. decemlineata* by its pale straw color and by the absence of the series of baso-pleural spots of the abdomen. In this latter character it approaches the larva of *L. juncta*.

Leptinotarsa texana has generally passed among American entomologists under the name *defecta*. Mr. Schaeffer, who took both species at Brownsville, has demonstrated the distinctness of the two forms. Tower has recently added to the confusion by treating *texana* under the name *defecta* and quoting the localities given by Stål and Sallé for the true *defecta*. The following references may help to clear the confusion.

Leptinotarsa defecta Stål.

Myocoryna defecta Stål, Öfv. af K. Vet. Ak. Förh., 1859, p. 317.

Chrysomela defecta Stål, Mon. Chrys. de l'amérique, 1862, p. 165.

Leptinotarsa defecta Jacoby, Biol. Centr. Amer., Phytophaga, I, p. 234, Pl. XIII, fig. 21, 1892.

Leptinotarsa defecta Schaeffer, Bull. Brookl. Inst. Arts and Sci., I, p. 239, 1906.

Leptinotarsa texana Schaeffer.

Leptinotarsa defecta Linell, Jour. N. Y. Ent. Soc., IV, p. 196, 1896.

Leptinotarsa 11-lineata Townsend, Trans. Tex. Acad. Sci., V, pp. 82-84, 1903.

Leptinotarsa defecta Tower, Evolut. in *Leptinotarsa*, pl. 23, fig. 20, 1906.

Leptinotarsa texana Schaeffer, Sci. Bull., Brookl. Inst. Arts and Sci., I, p. 239, 1906.

**BIOLOGICAL NOTES ON MEGILLA MACULATA
DE GEER.**

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The following brief descriptive and biological notes on this ladybird were obtained while making an attempt to keep many pairs in confinement through the several generations of a season, but which attempt failed because of the scarcity of food. There is included a description of the process of hatching, records of the period of incubation during portions of May and June, 1907, records of the larval and pupal instars for a single generation, and notes on adults kept in confinement, all of which are more or less fragmentary. The observations were made in the laboratory at New Richmond, Ohio, about latitude 38 degrees, 48 minutes north.